Remarks

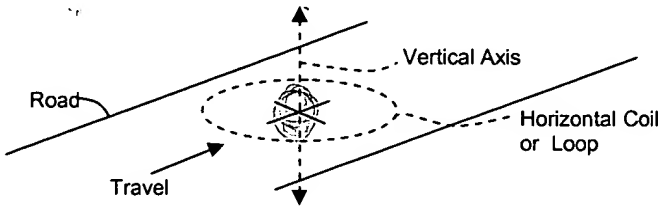
This amendment is responsive to the official action of Paper No. 7, wherein claims 1 and 3 were rejected for certain terms regarded as indefinite, and all the claims were rejected as anticipated by US Pat. 5,614,894 – Stanczyk. Claims 1-11 are pending. The claims have been amended to more definitely recite the subject matter. Reconsideration is requested.

The rejection under 35 U.S.C. §112 concerned certain alternative phrases that were considered indefinite. Applicant has eliminated the alternatives and has generally amended the claims for US practice. The claims as amended are definite.

The scope of the claims is not substantially changed because the claims already patentably distinguish from the prior art of record. Reconsideration is requested as to the Stanczyk reference that was cited as an anticipation. Stanczyk fails to teach or suggest the orientation of the sensing loops that is particularly and distinctly defined in applicant's claims. Thus, there is no basis of record to assert that the claimed invention as a whole would have been known or obvious.

Stanczyk employs the conventional technique of providing a vehicle sensing loop that has one or more coils mounted in a plane parallel to the plane of the road surface. The center axis of the loop therefore is vertical:

PRIOR ART

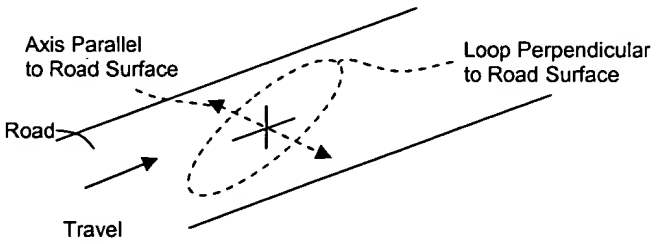


It is also known from Stanczyk to provide two or more coils or loops as an array. See Stanczyk Figs. 2 to 11. Nevertheless, in every case, the coils are mounted in a plane parallel to the plane of the road surface. The coil centers are spaced to provide a succession of coils. The coils can be placed successively along the direction of travel

or laterally across the width of the road, or even placed within one another (Fig. 11). Nevertheless, all the Stanczyk coils are disposed parallel to the plane of the road. The coil axes are vertical.

According to applicant's claim 1, at least one electrically conductive loop is arranged substantially in a plane perpendicular to the road surface. This clearly distinguishes from Stanczyk, who neither discloses nor suggests such an arrangement. Furthermore, claim 1 has been amended to prevent the examiner from taking a curious or hypothetical view as to what is meant by a loop being arranged perpendicular to the road surface. Claim 1 as amended further states that this arrangement defines an axis of the loop extending substantially parallel to the road surface. Claim 2 depends from claim 1 and states specifically that the coil axis can be lateral to the direction of travel. In claim 3, the axis can be parallel to the direction of travel. Independent claim 1 encompasses these and other orientations wherein the coil is substantially perpendicular to the road surface, rather than parallel as in the prior art.

CLAIMS 1 or 2 (e.g.)



The prior art arrangement as in Stanczyk of one or more coils with vertical axes reflects conventional thinking on positioning detector coils relative to the body of passing vehicle. As the vehicle passes over the coil, the ferrous or conductive metal in the vehicle traverses the axis while passing immediately adjacent to the coil, producing the desired electromagnetic result.

A loop in a plane is a two dimensional geometric shape, which appears in full size if viewed along a line normal to its plane. If viewed on a line that is inclined relative to normal, the shape is foreshortened according to the cosine of the angle of inclination. The loop is turned on edge and at 90°, the lumen of the loop appears closed. For this

reason, one often considers a coil to be aligned or aimed most efficiently precisely along the axis.

Applicant has discovered a way to take advantage of the fact that the electromagnetic field associated with a coil extends into the volume surrounding the coil, and not only along the coil axis. Applicant has positioned a coil "on edge," namely with its coil axis extending parallel to the surface of the road, and has discovered that this arrangement is effective for detecting the passage of metal wheels on a vehicle passing over the roadway.

There is no disclosure in Stanczyk of a similarly oriented detector/classifier apparatus, namely with a coil positioned in a plane perpendicular to the road surface instead of parallel to the road surface. As discussed above, applicant's decision to mount a coil in the claimed orientation was counter-intuitive. It seems that mounting a coil on edge would detract from the sensitivity of the coil to a ferrous mass such as an engine block or the like, passing over it. Nevertheless, applicant has determined that such a coil is particular effective for detecting and discriminating for the passage of the perhaps-closer metal wheels of the vehicle.

Stanczyk does not disclose the invention as a whole, and therefore the rejection for anticipation is unwarranted. There is no basis of record to conclude that the invention defined in amended claim 1 would be a routine or obvious variation of Stanczyk. On the contrary, the differences are such that the subject matter claimed as a whole would not have been obvious. As a result, claim 1 as amended is allowable.

The dependent claims recite additional aspects and are patentable by dependence on claim 1 and also on their own account. Claims 2 and 3 define particular orientations that are each different from the prior art. Re claim 4, a plurality of loops or coil turns can be mounted simply in a slot cut into the roadway, whereas a horizontal coil as in Stanczyk requires a more complicated series of intersecting slots, to form a receiving shape for a loop parallel to the plane of the road. The remaining claims also concern aspects such as a packaged unit to be mounted in the roadway, the inclusion of hybrid circuits, superimposing the detection results of the inventive coil on those of a

conventional coil, etc. These aspects are likewise not taught or suggested in the prior art of record.

The claims have been amended to particularly and distinctly define the subject matter regarded as the invention. The claims are definite. The prior art generally and specifically lacks the aspect of applicant's claimed coil orientation. The differences between the invention and the prior art are such that the subject matter claimed as a whole would not have been known or obvious to a person of ordinary skill in the art. Reconsideration and allowance of pending claims 1-11 are requested.

Respectfully submitted,

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Clean Copy of Claims as Previously and Currently Amended

1(currently amended). A vehicle detector and classifier comprising:

at least one electrically conductive loop arranged in a road having a road surface, wherein said at least one loop is arranged substantially in a plane perpendicular to the road surface, thereby defining an axis of the loop extending substantially parallel to the road surface.

2(currently amended). A detector according to claim 1, wherein said plane extends laterally across the road in a direction perpendicular to a direction of travel along the road.

3(currently amended). A detector according to claim 1, wherein said plane extends parallel to a longitudinal axis of the road, and parallel to a direction of travel along the road.

4(currently amended). A detector according to claim 1, wherein said at least one loop comprises a plurality of loops arranged in a line in a slot cut into the road surface.

5(currently amended). A detector according to claim 4, wherein at least one active electronic component is located in the slot and adjacent to said at least one loop.

6 (currently amended). A detector according to claim 5, wherein the components are mounted on circuits at regular intervals, said circuits comprising one of a small hybrid circuit and a thick film circuit.

7(currently amended). A detector according to claim 1, wherein the at least one loop is encapsulated in a semi-rigid enclosure.

8(previously amended). A detector according to claim 1, wherein said at least one loop is substantially rectangular as viewed along the axis.

9(currently amended). A detector according to claim 1, wherein said at least one loop comprises a plurality of turns.

10 (currently amended). A detector according to claim 1, further comprising an inductive loop arranged substantially along a plane of the road surface, thereby defining an axis of the inductive loop extending substantially perpendicular to the road surface.

11(currently amended). A detector according to claim 10, further comprising means for superposing a result obtained from the at least one loop arranged substantially along the plane of the road surface and a result obtained from the at least one loop arranged substantially in the plane perpendicular to the road surface, and means for displaying the results as thereby superposed.